

CLAIM AMENDMENTS

Claims 1 to 13. (canceled)

14. (previously presented) A method of smoothing a solid surface with a gas cluster ion beam, comprising:

- a) irradiating the solid surface with the gas cluster ion beam with an irradiation angle between the solid surface and the gas cluster ion beam being equal to or greater than 30°; and
- b) irradiating, after step a), the solid surface with the gas cluster ion beam with the irradiation angle being less than 30°.

15. (previously presented) A method of smoothing a solid surface with a gas cluster ion beam, comprising:

- a) irradiating the solid surface with the gas cluster ion beam with a first irradiation angle between the solid surface and the gas cluster ion beam being less than 30°;
- b) irradiating the solid surface with the gas cluster ion beam with a second irradiation angle between the solid surface and the gas cluster ion beam being equal to or greater than 30°; and
- c) repeating one or more times a continuous change of an irradiation angle between the first irradiation angle and the second irradiation angle while irradiating the solid surface with the gas cluster ion beam.

16. (currently amended) A method of smoothing a solid surface with a gas cluster ion beam, comprising:

- a) irradiating the solid surface with the gas cluster ion beam in a first direction with an irradiation angle between the solid surface and the gas cluster ion beam being less than 30° so that an orthographically projected direction defined by projecting an incident, wherein the first direction is defined by a projection of the gas cluster ion beam onto a plane defined by the solid surface accords with a first direction; and
- b) irradiating the solid surface with the gas cluster ion beam in a second direction with an irradiation angle between the solid surface and the gas cluster ion beam being less

than 30° so that the orthographically-projected direction accords with a, wherein the second direction is defined by a projection of the gas cluster ion beam on the plane and the second direction is different from the first direction.

17. (currently amended) The method of Claim 16 comprising varying the orthographically-projected-direction continuously back and forth between the first direction and the second direction while irradiating the solid surface with the gas cluster ion beam.

18. (previously presented) The method according to Claim 17, wherein the irradiation angle between the gas cluster ion beam and the solid surface is fixed during step a).

19. (previously presented) The method of Claim 16, wherein the second direction is 5° or more away from the first direction.

20. (previously presented) The method according to Claim 19 , wherein the irradiation angle between the gas cluster ion beam and the solid surface is fixed during step a).

21. (previously presented) The method according to any one of Claims 14, 15, 17 and 19, wherein the solid surface is a side wall surface of a concave structure or a convex structure.

Claims 22 to 23. (canceled)

24. (previously presented) A method of smoothing a solid surface with a gas cluster ion beam, comprising:

a step of irradiating the solid surface with the gas cluster ion beam with an irradiation angle between the solid surface and the gas cluster ion beam being less than 30° for at least a portion of a time period of a gas cluster ion beam irradiation,
wherein the solid is a thermal oxide film formed on a substrate.